

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

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PROJECT INITIATION

October 3, 1967

Project Title: GAD3 III Lens Study

Project No.: A-1046

Project Director: R. H. Goodman

Sponsor: Dept. of the Air Force, Air Proving Ground (AFPG)

Effective9-25-67..... Estimated to run until: 5-24-68

Type Agreement:Contract No. F02625-68-C-0011..... Amount:\$49,900.00.....

Reports: Monthly Status Reports
Draft of Final Report - Due 30 days after end of contract
Final Report - Due 30 days after draft approval

Contact Person: Mr. Qualls, PMCK, Contract Administrator
Air Proving Ground Center
Eglin Air Force Base, Florida 325 32542

Assigned toElectronics..... Division

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GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT TERMINATION

Date July 30, 1969

PROJECT TITLE: SADS III Lens Study

PROJECT NO: A-1046

PROJECT DIRECTOR: R. M. Goodman, Jr.

SPONSOR: Air Force Armament Development & Test Center - Eglin AFB, Fla.

TERMINATION EFFECTIVE: July 9, 1969

CHARGES SHOULD CLEAR ACCOUNTING BY: January 31, 1969*

*Final Invoice has been submitted and paid.
Subsequent charges should be transferred to
a Division Account when all have cleared.

Electronics Division

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GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

20 October 1967

A-1046

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 1

Gentlemen:

A summary of progress for the period 24 through 30 September on the referenced contract is contained herein.

Prosecution of the project has been designated Engineering Experiment Station Project A-1046. The project is under the general supervision of Dr. M. W. Long, Chief of the Electronics Division, and under the direct supervision of Dr. R. C. Johnson, Project Director and Head of the Radar Branch. It is anticipated that the following key personnel will participate in the project:

<u>Name</u>	<u>Title</u>
R. M. Goodman, Jr.	Senior Research Engineer
R. C. Johnson	Principal Research Physicist
L. A. Stapleton	Senior Research Engineer
R. D. Wetherington	Senior Research Physicist

Initial efforts were devoted to the organization of our efforts. R. D. Wetherington and R. C. Johnson will work on the theoretical design of the lens, and Mr. Wetherington will supervise the programming



and studies on the Burroughs B-5500 computer. R. C. Johnson and R. M. Goodman will conduct some layout studies to determine suitable aperture dimensions and f/D ratios. R. M. Goodman and L. A. Stapleton will conduct mechanical layout studies to insure that the lens can be employed in a practical antenna.

It is anticipated that the month of October will be devoted to a continuation of efforts initiated during September.

Respectfully submitted,

R. C. Johnson
Head, Radar Branch

RCJ:jan

cc: R. M. Goodman, Jr.
Georgia Tech

GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

9 November 1967

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 2

Gentlemen:

A summary of progress for the period 1 through 31 October on the referenced contract is contained herein.

On 5 October 1967, R. M. Goodman, Jr., L. A. Stapleton, and R. C. Johnson visited AFGC to review plans and progress on the contract. On 17 October 1967, R. M. Goodman, Jr., and R. C. Johnson visited MID for technical discussions with Jim Cosby and Dave Powell.

An approach for designing the lens has evolved, and the writing of an initial program for the B-5500 computer has been initiated. Preliminary layout studies have begun to determine suitable aperture dimensions and f/D ratios.

During the month of November, it is anticipated that initial computer programs will be tested, that the preliminary layout studies will be completed, and that mechanical layout studies will be initiated to insure that the lens can be employed in a practical antenna.

Respectfully submitted,

R. C. Johnson
Head, Radar Branch

RCJ:jan

cc: R. M. Goodman, Jr.
Georgia Tech



GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

5 December 1967

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 3

Gentlemen:

A summary of progress for the period 1 through 30 November on the referenced contract is contained herein.

On 8 November 1967, R. M. Goodman, Jr., and R. C. Johnson visited APGC for technical discussions which included some of the results of the preliminary layout studies. On 30 November 1967, R. M. Goodman, Jr., and R. C. Johnson visited APGC to attend a briefing presented by Dr. A. E. Ruvin of Airborne Instruments Laboratory.

The initial computer program for calculating the lens has been prepared, and the process of testing and debugging has been initiated. The preliminary layout studies were completed, and mechanical layout studies were initiated to insure that the lens can be employed in a practical antenna.

During the month of December, computer efforts to calculate the lens and the mechanical layout studies will be continued.

Respectfully submitted,

R. C. Johnson
Head, Radar Branch

RCJ:jan



GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

10 January 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542



Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 4

Gentlemen:

A summary of progress for the period 1 through 31 December 1967 on the referenced contract is contained herein.

The initial computer program for calculating mean surface coordinates for the lens has been completed and tested with good results. Coordinates for a sample lens, having a normalized aperture of 200 units and an f/D ratio of unity, were calculated, and the design was validated by calculating path lengths for several rays within the aperture. All path lengths were within 0.002 units of the central ray. This indicates that the sample lens was defined more accurately than machining tolerances, which is the desired situation.

The mechanical layout studies have progressed using approximate mean surface coordinates; however, accurate lens coordinates now can be calculated for use in the remainder of the layout studies.

During the month of January, the mechanical layout studies will be continued, an investigation of techniques for fabricating lenses will be initiated, and off-axis characteristics of the lens will be investigated.

Respectfully submitted,

R. C. Johnson
Head, Radar Branch

RCJ:jan

cc: R. M. Goodman, Jr.
Georgia Tech



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia · 30332

5 February 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 5

Gentlemen:

A summary of progress for the period 1 through 31 January 1968 on the referenced contract is contained herein.

On 22 January, R. M. Goodman, Jr., visited APGC to discuss some specific technical aspects of the SADS III lens study.

Accurate lens mean-surface coordinates have been calculated for a full-size lens, and these coordinates will be used in the remainder of the layout studies. The lens is expected to have good off-axis characteristics, but efforts have been initiated to investigate this feature.

Consideration has been given to various manufacturing techniques which have the potential of producing the components of the new geodesic lens. Among the processes under consideration are: deep-draw forming techniques (requiring the use of large hydraulic presses), stretch-wrap forming, explosive forming, and hydraulic bulging. These forming methods, either singly or in combination, have been used by the air-frame and missile industries to produce parts of comparable size and depth. The tolerances required for geodesic lenses, however, are stricter than those normally achieved on parts made by the methods listed above. Inquiries have been directed to the Lockheed Manufacturing Research Facility at Burbank, California, to the Cyril Bath Company in Cleveland, Ohio, to the Blue Bird Body Company (which has a stretch-wrap forming capability) in Ft. Valley, Georgia, and to the Research Center of Alcoa in Merwin, Pennsylvania.



Contract F08635-68-C-0011

Page 2

5 February 1968

A trip was made on 30 January by J. S. Cooley, L. A. Stapleton, and R. M. Goodman, Jr., to the Blue Bird Body Company to investigate their manufacturing capability. The Georgia representative of the Lockheed California Company has been given sketches and descriptions of the manufacturing requirements and is preparing recommendations and quotations for the manufacture of the lens components. Georgia Tech is investigating the hydraulic bulging procedure. Project personnel and Mr. Francis McKee, head of the Alcoa metal working research division, considered this to be the most promising of the various manufacturing methods under consideration. A 1/4 scale mechanical test model is being prepared to test hydraulic bulging as applied to the specific shapes involved.

During the month of February, the mechanical layout studies, the investigation of off-axis characteristics, and the considerations of techniques for fabrication will continue.

Respectfully submitted,

R. C. Johnson
Head, Radar Branch

RCJ:jan

cc: R. M. Goodman, Jr.
Georgia Tech

GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

12 March 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 6

Gentlemen:

A summary of progress for the period of 1 through 29 February 1968 on the referenced contract is contained herein.

The investigation of off-axis characteristics of the lens has continued. A computer program to trace rays through the lens for off-axis feed positions has been written and checked to be sure that it performs as desired. During the month of March, the theoretical pattern from a feed horn will be transformed through the lens to obtain aperture illumination functions for several selected positions of the feed. The aperture illumination functions then will be used to predict far-field patterns from the lens for several scan angles. This investigation will yield considerable insight concerning the expected performance from the lens.

During February, modification No. P002 to the referenced contract was executed; this modification covers Phase II of the Georgia Tech proposal on the SADS III lens study. In accordance with this proposal, R. M. Goodman, Jr. has been named as Project Director for this portion of the work under the contract.

The 1/4 scale mechanical test model has been designed and is being fabricated in the Georgia Tech shop. Material has been received and the tests of the hydraulic bulging model will be initiated as soon as possible after completion of the components. Mechanical design has been initiated for the antenna incorporating a full size lens.



Contract F08635-68-C-0011

Page 2

12 March 1968

During the month of March, the mechanical design of the test antenna, the investigation of off-axis characteristics, and the considerations of techniques for fabrication will continue.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

cc: R. C. Johnson
Head, Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia 30332

17 April 1968

A-1046

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 7

Gentlemen:

A progress summary on the referenced contract for the period of 1 March through 31 March 1968 is presented herein.

The components for the 1/4 scale lens forming press and the related hydraulic equipment items were completed, and it is anticipated that this equipment will be ready for experimental use early in April. The scaling of the design of equipment for forming a full size lens was begun, and quotations have been requested for alternate types of hydraulic pressure vessels for this phase of the contract work.

Mechanical design of the full size antenna has continued, and a purchase order for the honeycomb structure material has been issued.

The investigation of off-axis characteristics of the lens has continued. The theoretical pattern from a feed horn was transformed through the lens to obtain aperture illumination functions for several selected positions of the feed, and the aperture illumination functions then were used to predict far-field patterns from the lens for several scan angles. This investigation is yielding considerable insight concerning the expected performance from the lens, and it will be continued next month in order to choose what is expected to be the best feed arc.



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Monthly Status Report No. 7

17 April 1968

During April experimental development of 1/4 scale lens parts will be followed by extension of the data obtained to define design limits for use in full size lens fabricating.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

cc: R. C. Johnson
Head, Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia 30332

16 May 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 8

Gentlemen:

A progress summary on the referenced contract for the period of 1 April through 30 April 1968 is presented herein.

Tests have been performed using the 1/4 scale lens forming process. The process involved is generally termed "hydraulic bulging"; for the parts involved an elongation of slightly over 50 percent is required in order to complete the bulging process. Elongation expected for the materials used, without intermediate annealing, is normally about 30 percent. The plans for this test program include the requirement, therefore, for intermediate anneals which should extend the elongation capability of the material satisfactorily. Experiments to date, however, have indicated that the annealing process recommended by Alcoa and implemented by a commercial heat-treating company do not, in fact, extend the elongation limit as expected. The bulging parts have all failed (ruptured) in the vicinity of the fillets prior to final bottoming in the mold.

Alternate approaches have been considered from the beginning of this program; these include explosive forming and metal spinning. In view of the problem encountered in the hydraulic experiments, the spinning process, which appears to be the most straightforward, will be investigated carefully. Plans are underway to visit the C. W. Torngren Company in Somerville, Mass., to discuss the spinning approach. This company has successfully spun a number of geodesic



Contract No. F08635-68-C-0011

Page 2

16 May 1968

Luneberg lenses for Georgia Tech. Steps are also being undertaken to produce the various templates and machine parts which must be made on a large numerically controlled milling machine. Various sources have been contacted and it appears probable that the Lockheed Georgia Company, which is nearby, will be able to do the necessary machining.

The honeycomb structure sandwich panels for the flat parallel plate region of the model lens have been received.

The investigation of off-axis characteristics of the lens has been completed. The theoretical pattern from a feed horn was transformed through the lens to obtain aperture illumination functions for several selected positions of the feed, and the aperture illumination functions then were used to predict far-field patterns from the lens. It was found that a feed arc having a radius equal to the focal length and passing through the focal point yielded satisfactory results. The theoretical side lobe levels remained below -20 dB within a scan sector of ± 9 degrees. It appears that other feed arcs will yield only slight improvements in the performance. These predictions will be checked by measurements with a model lens on an outdoor antenna range.

During May manufacturing plans for the full size model lens will be finalized. Purchase orders for lens work which must be done by outside sources will be issued during May.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

cc: R. C. Johnson
Head, Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia 30332
9 July 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 9

Gentlemen:

A progress summary on the referenced contract for the period of 1 May through 31 May 1968 is presented herein.

On 2 and 3 May 1968 R. M. Goodman, Jr., visited C. W. Tornngren Co., of Somerville, Mass., to discuss the spinning of geodesic lens parts for this program. A satisfactory plan was developed in conjunction with Tornngren during this visit. Tornngren submitted a quotation dated 8 May 1968 which was considered acceptable both as to scope of work and price. On 29 May a purchase order was issued to Tornngren for the lens part spinnings required.

On 8 May 1968 a meeting was held at the Lockheed-Georgia Co., concerning the numerically controlled milling work required to machine the templates and lens part fillet plates for the football type geodesic lens. Lockheed submitted a satisfactory quotation for this work which was dated 22 May 1968. Consent for the issuance of the Lockheed purchase order was requested from Mr. J. D. Qualls, PGMKK, on 29 May.

The mechanical design of the breadboard model antenna including the full size football type geodesic lens is approximately 80 percent complete. During June work will continue on the design of the full size model lens. It is anticipated that the purchase order for the numerically controlled milling work to be done by Lockheed will be issued during June.

Respectfully submitted:)

R. M. Goodman, Jr. ✓
Project Director

RMG:mo
Copy to:
Radar Branch file





GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia 30332

9 July 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 10

Gentlemen:

A progress summary on the referenced contract for the period of 1 June through 30 June 1968 is contained herein.

Following receipt of the consent to place a purchase order with Lockheed in accordance with their quotation of 22 May a purchase order was placed with the Lockheed-Georgia Co., on 10 June 1968 for the numerically controlled milling work required under the contract.

Work is progressing satisfactorily at the C. W. Torngren Co., on the spinning work for the lens parts. Templates have been prepared for the spinning chucks and for the inspection of the spun parts; these were shipped to Torngren on 14 June 1968. Methods have been devised for facilitating the inspection of the parts as made and the accuracy of the sub-structures to be assembled at Georgia Tech.

The mechanical design of the full size model football type geodesic lens is essentially complete. The primary feed horn and the line source horn for this model have been designed. Tests have been made of the proposed methods of joining the honeycomb panels which will make up the plane sections of the parallel plate assembly. Satisfactory joints have been developed.

During July the manufacture of components for the full size model lens will continue.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo
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Radar Branch file





GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest • Atlanta, Georgia 30332

8 August 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

• Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 11

Gentlemen:

A progress summary on the referenced contract for the period of 1 July through 31 July is contained herein.

Longitudinal checking templates for the football type geodesic lens have been received from the Lockheed Georgia Company. These templates were cut on a numerically controlled machine from data calculated by Georgia Tech. Measurement checks by Georgia Tech indicate that a high degree of accuracy was obtained.

The spun parts for the geodesic lens are on order with the C. W. Tornngren Company. It was anticipated that the first pair of these parts would be finished prior to the Tornngren shutdown for vacation on 19 July. Vibration problems with the lathe on which these parts are to be spun has caused the postponement of this work until lathe repairs can be made after 5 August. Spinning and shipment is now scheduled for the week of 12 August. This represents a delay of three to four weeks in the receipt of the spun lens parts from Tornngren and will effect a delay in construction work in the order of two to three weeks.

The fillet plates which will be fitted between the spun lens parts and the flat plate structures are on order with the Lockheed Georgia Company. Material is on hand and Lockheed is waiting for special cutters which they have ordered and which are expected the week of 5 August. Lockheed has promised delivery of the fillet plates shortly after receipt of the cutters. The fillet plate work is not expected to extend



Contract No. F08635-68-C-0011


Page 2

8 August 1968

construction time beyond that already mentioned in connection with the delay of parts from Torngren.

Construction work at Georgia Tech on honeycomb panel parallel plate items and feed horn and support is progressing well. Efforts will be made to reduce the effect of the delays at Torngren and Lockheed.

On 18 July, Mr. Cal Miley and Mr. John Wayland of Eglin Air Force Base, Florida visited Georgia Tech. They were shown construction work underway and were given a verbal account of the status of progress on the contract.

Respectfully submitted: 

R. M. Goodman, Jr. 
Project Director

RMG:mo

Copy to:
Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest · Atlanta, Georgia 30332

12 September 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

A-1046

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 12

Gentlemen:



A progress summary on the referenced contract for the period of 1 August through 30 August is contained herein.

The first of the spun parts for the geodesic lens has been received from the C. W. Torngren Company. This part has been inspected and is within tolerance. The second part to be made by Torngren is in process and is expected in early September. No problems are anticipated with the second lens part; however, the Torngren delivery represents a delay in the project of approximately six weeks. Difficulties with equipment at Torngren which were reported on in Monthly Status Report No. 11 are responsible for this delay.

The first of the geodesic lens fillet plates ordered from the Lockheed Georgia Company has been received and inspected; it is extremely accurate. This fillet plate is a component of the composite inner lens part. The spinning received from Torngren is the outer lens part spinning and thus no final assembly work has been started. The outer lens part fillet plate has been delayed due to lack of special form cutters which were ordered by Lockheed some time ago but have not been received. Completion of the outer lens part fillet plate has been promised for mid September by the Lockheed Georgia Company. Lockheed's slow delivery on the fillet plates has roughly matched the delay at the C. W. Torngren Company and the combined delay occasioned by the slow delivery of the components is approximately six weeks at this time.

Eighty percent of all other parts for the lens are completed and await final assembly which is either in process or being set up.

Contract F08635-68-C-0011
Monthly Status Report No. 12
Page 2

During September final assembly will be started on the composite inner lens part and it is hoped that assembly of the composite of the outer lens part can also be started.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

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Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest - Atlanta, Georgia 30332

9 October 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 13

Gentlemen:

A progress summary on the referenced contract for the period of 1 September through 30 September is contained herein.

Inspection of the inner composite lens part for the geodesic lens discloses excellent accuracy. This composite part consists of the inner lens part fillet plate and the inner lens part spinnings. The outer lens part spinnings have also been received from the C. W. Torngren Company and have been inspected. These spinnings were not machined as were the spinnings for the inner lens part since the conducting surface of the outer lens part spinning is the inside surface. The accuracy of these parts, as spun, is acceptable.

Lockheed has finally received the special form cutters for the outer lens part fillet plate. The delay in receipt of these cutters has been the main reason Lockheed has been unable to complete this final part. With the cutters available, Lockheed expects to finish and deliver the final part during the first week of October.

Assembly is proceeding on the various components of the test lens. No major difficulties have been experienced.

During October the inner composite lens part will be completed and the final assembly of the outer composite lens part will be started.



Contract F08635-68-C-0011
Monthly Status Report No. 13
Page 2

It is anticipated that the complete lens assembly will be ready for testing on the Georgia Tech antenna range early in November.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

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Radar Branch



GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest - Atlanta, Georgia 30332

13 November 1968

Air Proving Ground Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 14

Gentlemen:

A progress summary on the referenced contract for the period 1 October through 31 October is contained herein.

The final outer lens part fillet plate was received from the Lockheed-Georgia Company early in October. This component was inspected and found to be satisfactory. The receipt of this part completed the orders for special components from outside suppliers.

Final assembly of the test lens components was completed during this period. No major difficulties were encountered. Workmanship is very good and the physical structure appears to be well suited for the intended purpose.

The test set-up has been prepared and the lens will be tested on the Georgia Tech antenna range during November.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

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Radar Branch





GEORGIA INSTITUTE OF TECHNOLOGY
EXPERIMENT STATION

225 North Avenue, Northwest • Atlanta, Georgia 30332

17 December 1968

Armament Development Test Center
Eglin Air Force Base
Florida 32542

Attention: Physical Sciences Branch
PGVEP-3

Reference: Contract F08635-68-C-0011

Title: SADS III Lens Study

Subject: Monthly Status Report No. 15

Gentlemen:

A progress summary for the period 1 November through 30 November on the referenced contract is contained herein.

Testing of the primary feed horn for feeding the football-type geodesic lens antenna was started during the month of October. Since no problems were anticipated, the test program was not referenced in Monthly Status Report 13. During early November, it became obvious that the primary feed horn which had been designed did not have satisfactory radiation characteristics. An intensive development program was undertaken immediately to produce an acceptable feed horn. During this development program, which required the contributions of several senior staff members, a dielectric corrective lens for the primary horn was produced. The football lens test program on the Georgia Tech antenna range included use of the modified primary feed horn. The above unexpected problems with the primary feed horn have been reported to technical personnel at the Armament Development Test Center.



Contract F08635-68-C-0011
Monthly Status Report No. 15
Page 2

Most of the month of November was spent in far-field pattern testing on the Georgia Tech antenna range. Results of the tests were quite satisfactory.

In addition, time also was spent in the analysis of data and in the preparation of the final report.

Respectfully submitted:

R. M. Goodman, Jr.
Project Director

RMG:mo

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Radar Branch